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sensor exceeds a predetermined acceleration limit when the flexible display device is dropped.

In operation, the catch **94** of the transmission lever **90** engages the spreader lever **60** when the spreader mechanism **50** is moved to the open position to display the flexible display for use. The surface of the spreader lever **60** engaging the catch **94** can be radiused to allow the spreader lever **60** to move easily into the latched position where the catch **94** locks. The catch **94** holds the spreader mechanism **50** in the open position against the tension on the flexible display which tries to close the flexible display device. When the flexible display device is dropped, the solenoid coil **82** receives a close signal from the acceleration processor to energize the solenoid coil **82**. The force from the solenoid plunger **84** overcomes the force from the spring **86**, which releases the spreader lever **60** from the catch **94**. The tension on the flexible display moves the spreader mechanism **50** to the closed position so that the spreader mechanism **50** and flexible display are enclosed and protected in the housing of the flexible display device. Typically, the flexible display device is in the closed position before it strikes the floor. In one embodiment, the latch assembly **36** includes a mechanism so that the release of the latch assembly **36** can be performed manually to close the flexible display device. For example, the arm **92** or an extension of the arm **92** can protrude from the housing of the flexible display device and the user can manually release the spreader lever **60** from the catch **94** by pushing the arm **92**. In another embodiment, the latch assembly **36** can be activated by the user to close the flexible display device. For example, the solenoid coil **82** can be energized by pushing a button or other switch to provide power to the solenoid coil **82**.

FIG. **5** is a block diagram of a control circuit for a flexible display device made in accordance with the present invention. The control circuit **100** uses an acceleration sensor **102** to detect the acceleration of the flexible display device. The acceleration sensor **102** generates an acceleration signal **104**, which is provided to an acceleration processor **106**. The acceleration processor **106** is responsive to the acceleration signal **104** and generates a close signal **108** when the acceleration signal **104** exceeds a predetermined minimum acceleration limit, indicating that the flexible display device has been dropped. The close signal **108** is provided to the latch assembly **36**, which is responsive to the close signal to release the spreader mechanism from the open position, allowing the tension on the flexible display to close the flexible display device. In one embodiment, the control circuit **100** can include an optional button **110** or other switch as a user actuated device to generate the close signal **108** to the latch assembly **36** to release the flexible display device from the open position.

The acceleration processor **106** can be any processor operable to provide a close signal responsive to an acceleration signal, such as a data processor, a microprocessor, an analog circuit, or the like. The acceleration processor **106** can be a portion of the main processor used in the flexible display device to carry out device functions, such as graphics display, GPS information processing, or other functions, or can be an independent processor dedicated to providing the close signal in response to the acceleration signal. Exemplary acceleration sensors include the Kionix KXP74-1050 from Kionix, Inc., of Ithaca, N.Y.; the Freescale MMA7260Q from Freescale Semiconductor, Inc., of Austin, Tex.; and the Memsic MXA2500G&M from Memsic, Inc., of North Andover, Mass.

FIG. **6** is a flow chart of a control method for a flexible display device made in accordance with the present invention.

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The control method is implemented by the acceleration processor using the acceleration signal from the acceleration sensor and generates the close signal.

In this example, the control method **200** runs in a loop when the flexible display device is not in the closed position. The acceleration sensor measures the acceleration of the flexible display device **202**, such as measuring the acceleration of the center of mass of the flexible display device. It is determined whether the absolute value of the acceleration is greater than a predetermined minimum acceleration limit  $a_{min}$  **204**. In one embodiment, the predetermined minimum acceleration limit  $a_{min}$  is a large fraction of gravitational acceleration, such as about  $9.5 \text{ m/sec}^2$  or the like. In one embodiment, it is also determined whether the absolute value of the acceleration is less than a predetermined maximum acceleration limit  $a_{max}$  **204**. In one embodiment, the predetermined maximum acceleration limit  $a_{max}$  is slightly larger than gravitational acceleration, such as about  $10.0 \text{ m/sec}^2$  or the like. When the absolute value of the acceleration is not greater than a predetermined minimum acceleration limit, the counter *i* is reset to the initial value **206** and the control method **200** continues with measuring the acceleration of the flexible display device **202**. When the absolute value of the acceleration is greater than a predetermined minimum acceleration limit, the counter *i* is incremented **208**.

It is determined whether the counter *i* is greater than a predetermined number of intervals, such as five intervals **210**. The predetermined number of intervals can be one or more. When the counter *i* is less than or equal to a predetermined number of intervals, the control method **200** continues with measuring the acceleration of the flexible display device **202**. When the counter *i* is greater than a predetermined number of intervals, a close signal can be generated. In one embodiment, it is optionally determined whether the flexible display device is in the open position **212**. When the flexible display device is in the open position, the flexible display device is released from the open position **214**, such as releasing a latch assembly in response to a close signal. When the flexible display device is not in the open position, the counter *i* is reset to the initial value **216** and the control method **200** continues with measuring the acceleration of the flexible display device **202**. Those skilled in the art will appreciate that the determination whether the flexible display device is in the open position **212** can be omitted and the flexible display device released from the open position when the counter *i* is greater than the predetermined number of intervals, regardless of the position of the flexible display device.

The loop time can be selected to assure that the flexible display device has been dropped before closing the flexible display device, while allowing time to close the flexible display device before the flexible display device hits the floor. The loop time acts as a clock and the predetermined number of intervals acts as a timer setpoint for determining whether the flexible display device has been dropped. In one embodiment, the loop time is about 20 msec. A drop of 1.25 meters takes about 500 msec, on earth. With a loop time of 20 msec. and a predetermined number of intervals of five intervals, the close signal is generated in 100 msec, after the flexible display device is dropped. This leaves 500 less 100 msec., or 400 msec., for the flexible display device to close before it hits the floor. Those skilled in the art will appreciate that loop time and predetermined number of intervals can be selected for the particular application desired. The predetermined number of intervals in which the value is between  $a_{min}$  and  $a_{max}$  can be set to a value greater than one interval to make sure the measured value is really a drop and not a coincidence. Typically, the